TRI SAGE CONSULTING
Monthly Report
Carson Truckee Water Conservancy District

September 2, 2014

MONTHLY ACTIVITIES

1) Monitoring River flow for modeling survey timing;
2) Exploring the permitting requirements for removal of the Box Culvert at Idlewild during low river conditions.
3) Inspected river channel during low flows along Riverside Drive near Keystone Bridge to determine if there are shoaling deposits present that need to be removed.
4) Inspect river and review debris removal needs on the river for 2014.
5) Meeting with TRFMA and modeling team regarding possible LIDAR aerial surveying of river channel once river flows decline due to drought conditions.

UPCOMING ACTIVITIES

1) Work with TRFMA to pursue LIDAR aerial survey of the river channel while flows are reduced.
2) Pursue debris removal work for 2014 as authorized and directed by the Board.
3) Survey of areas downstream of Keystone Avenue bridge for HEC-RAS Modeling of problem area where water leaves the channel at 14,000cfs;
4) Pursue Idlewild Box Culvert removal including permitting needs; Otherwise Survey of areas around Idlewild Box Culvert for HEC-RAS Modeling of box culvert impacts at 14,000cfs as requested by USACE;
5) Evaluate additional needs for model updates upstream of Keystone Avenue to State Line and downstream of Lake Street to Glendale Bridge.
6) Run 14,000cfs steady state HEC-RAS flow model to establish water surface elevations along key river locations to evaluate issues; complete sections upstream and downstream of downtown.
7) Continued coordination with USACE regarding 14,000cfs model outcomes and evaluation of channel walls in downtown Reno and appropriate application/confirmation of SWIF process eligibility;
8) Continued coordination with City of Reno for 1) Flood Response evaluation and incorporation of Interim Risk Reduction Measures into their plan, 2) Flap-gate Installation needs and project, 3) Vegetation Variance for trees along channel- not expected to be necessary due to interim order, 4) Box Culvert facility evaluation and potential removal project;

9) Draft Vegetation Variance Application for Trees in Vegetation Free Zone if applicable under SWIF; confirm eligibility with USACE.
10) Finalize the Equipment Access/Entry Point Documentation and Mapping for the District Jurisdiction;

SUMMARY REPORT

River flows through downtown Reno have been in the 80-100cfs range over the past week and will continue to drop unless there is precipitation in the watershed. Tahoe's level continues to drop and is controlling the outflow to the Truckee River 58cfs on 9/1/14 and dropping.

Tri Sage inspected the river channel below Keystone during 76cfs flow conditions to see if there were shoaling deposits present that are causing the flows to jump the bank into Riverside Drive during a 14,000cfs event. Unfortunately, there are not classic shoaling deposits in this reach, only rocky river bed that is not suitable for removal or disturbance. Based on this finding, additional survey data will be collected for this area to model the 14,00cfs flow and determine appropriate next steps if the surveys do not resolve the model issues.

CTWCD met with the TRFMA team regarding the proposal to perform a Topo-Bathymetric study of the river from the State Line to Wadsworth during this low flow period. The cost estimates are attached to the Board report on that specific topic. It is recommended in that Board report that the CTWCD contribute to this effort in support of TRFMA Truckee River Modeling efforts.

During low river flows this fall, flows are expected to dry up the river bed immediately around the Idlewild Box Culvert and possibly present an opportunity for cutting the box back to the bank and removal of the culvert section from the channel without the need for channel dewatering and without concern for silt removal from the box section. USACE Regulatory has indicated that this is either a non-permit required project or may be completed under a Nationwide -3 permit without notification. Tri Sage will work with the City of Reno to evaluate the possibility of taking this opportunity to pursue other permits and remove this box section during this unique opportune time.

The inspection for debris removal needs in 2014 has been completed. The volume of debris is much less than 2013 due to the large project completed last year. Tri Sage will pursue the removal of debris once budget authorization and preferred methodology are directed by the Board. One option would be to limit the expenditure to $25,000 and allow Tri Sage to recruit and direct a contractor to perform the work and prioritize the removal work to spend only this amount; this level of spending is anticipated to remove the majority of the debris identified. A second option would be to have the Board issue a not- to –exceed limit of $75,000 and then have Tri Sage create a bid package with maps and locations for contractors to submit quotes on; this will insure that all identified debris will be removed, but will take time and have additional costs. This item as well as other methodologies will be discussed as a Board agenda item.

Currently the schedule for Virginia Street Bridge construction will be for a start of work in 2015 as soon as river conditions permit assuming all permits are received by the City of Reno. The

City will need a letter from the CTWCD authorizing work prior to June if work in the channel is possible due to flow conditions. At the last meeting the Board delayed acting on this letter until closer to the project start time.

Notably, the USACE has yet to issue their inspection report from April 2013. As a reminder, the USACE criteria for rehabilitation funding and notifications changed late in 2013 such that the CTWCD inspection issues are not subject to loss of the rehabilitation funding nor notification.

Since the May 2014 monthly report, no further discussion has been had with the USACE regarding the determination of "Floodwalls" versus "Channel walls" through the downtown Reno river corridor; however this is an issue that will be pursued for some resolution as it impacts other inspection issues as noted below.

The Status of USACE inspection issues are noted below and the status remains unchanged since July's Monthly report except for the noted change in the river flow reduction from July to the current timeframe of mid-August:

1) Shoaling- the shoaling deposits identified by USACE have been included in the recent modeling and at the current stage are NOT impacting the 14,000cfs flow. The USACE requested sensitivity analyses have been performed and indicate that doubling the size of the shoaling deposits does NOT push the waters out of the banks in any of the four areas identified during the inspection. There is a new area of possible shoaling identified downstream of Keystone Avenue Bridge that may be the cause of 14,000cfs flows leaving the banks along Riverside Drive; this area will be surveyed(probably once river flows drop out in mid-August) and deposits evaluated to get data for further evaluation in the model.
2) Flap-gates- Now that we have model water surface elevations in the downtown areas, the City of Reno will evaluate each penetration relative to the water surface elevation at 14,000cfs. (This work has been delayed due to personnel changes at the City). Once we have the model updated and run at the reaches upstream and downstream of the downtown areas to produce water surface elevation data, the City of Reno will continue their evaluation on the storm-drain penetrations into the channel. Tri Sage was able to get GIS data for the strom drain locations to correlate to model flow elevations.
3) Vegetation- vegetation along the walls and growing from the walls was removed by the City of Reno as part of the 2013 Debris Removal Project; however during the inspection it was noted that vegetation is developing again. This will be cut back as part of the 2014 project work. Potential determination of the walls as channel walls, not floodwalls means that there is no "vegetation free zone" requirement and other than the short section that the USACE might determine to be floodwalls, vegetation may become a moot point once specific determination is confirmed.
4) Idlewild Box Culvert/Bank Erosion- if not removed during low flows, the model needs to be evaluated and updated in this section; additional survey data(which will be collected in mid-August after the River flows drop) is required as the model contains minimal cross-sections in this reach. Once the model is updated with additional survey data, it will be run to determine the impact of the box and the need for removal. It is anticipated that this box will need to be removed to reduce the erosion of the Idlewild Drive bank. USACE is awaiting evaluation results and proposed solutions for this reach.

5) Flood Response- It appears from the current modeling that the 14,000cfs water surface elevation is below the horizontal surface in all areas downtown except for the West Street Plaza area. There was no approved encroachment by the USACE or the CTWCD for this project including the removal of the walls and railings along this section of river. The USACE has requested that the CTWCD work with the City of Reno to propose Interim Risk Reduction Measures that can be reviewed and approved by the USACE and incorporated into the City's Flood Response Plan. It is not clear at this writing what the requirements will be relative to the placement of plywood along the railings and walls as called for in the Martis Creek Agreement now that it is apparent from the modeling that the 14,000cfs flow is below the top of wall and below the horizontal surface in all sections except the West Street Plaza.

Next steps include the evaluation and running of the model in reaches above and below the Keystone to Lake Street areas for the determination of water surface elevations. Additional survey data will be collected, once river flows drop in mid-August, at the sections below the Keystone Avenue Bridge where the water leaves the channel at 14,000cfs and at the Idlewild box culvert as well as other sections where the modeling efforts may require additional sections. The modelers will analyze the box culvert (if not removed) and also perform sensitivity on the shoaling areas to determine if and when these areas will become problematic to the flow. The City of Reno will work to address the flap-gate needs as well as the Interim Risk Reduction Measures for the West Street Plaza. At this time it is anticipated that work may need to be done to remove deposits in the river near Keystone Avenue and to remove the box culvert at Idlewild Drive. The exact requirements of these potential projects are still under evaluation.

RECOMMENDATION

It is recommended that the Board of Directors direct Tri Sage related to the funding levels and preferred methodology for the 2014 Debris Removal Project work.

It is recommended that the Board of Directors provide direction regarding the removal of the Idlewild Box Culvert including funding and/or support for removal.

It is recommended that the Board contribute to the TRFMA LiDAR Topo-Bathymetric survey of the river for use in modeling the channel.

It is recommended that the Board of Directors continue to pursue the inspection/evaluation items as outlined in this report.